

Catalogue of American Amphibians and Reptiles.

McCrane, J.R. 1991. *Crotalus intermedius*.

***Crotalus intermedius* Troschel**
Mexican Small-headed Rattlesnake

Crotalus intermedius Troschel, 1865:613. Type-locality, not given, but México is inferred from title of paper (Troschel, 1866:188 stated "aus Mexiko" and Klauber, 1952:10, briefly discussed the route of the expedition that collected the holotype). Holotype formerly in the Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn (ZFMK), but now lost (see Klauber, 1952:10).

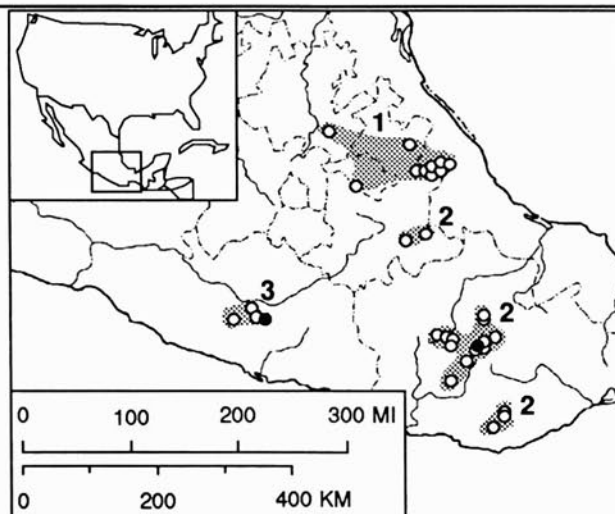
Crotalus tigris: Garman, 1884a:117 (part).

Crotalus triseriatus: Boulenger, 1896:581 (part).

Crotalus triseriatus triseriatus: Klauber, 1936:248 (part).

• **Content.** Three subspecies are recognized: *intermedius*, *gloydi*, and *omiltemanus*.

• **Definition.** *Crotalus intermedius* is a small rattlesnake, ranging in size from about 150 mm at birth to 709 mm in the largest measured specimen. The dorsal ground color is gray, grayish brown, brownish gray, or brown, with 36-61 body blotches. These blotches are black or dark brown edged, with paler centers (gray, brown, or reddish brown), although many large specimens from Guerrero lack distinctly paler centers. Blotches are also usually inconspicuous in large adults from Guerrero. The body blotches are 1-3 (usually 1 1/2-2 1/2) scale rows long, and 3-7 (usually 5-6) scale rows wide with the interspaces between the blotches 1-2 (usually 1-1 1/2) scale rows long. Crossbars on the tail number 4-9 (usually 6 or 7). Three rows of alternating lateral spots are present, although these are not always evident in large adults from Guerrero. The chin usually is white with brown punctations or cream with brown punctations, with the venter becoming progressively darker posteriorly. Some specimens from Guerrero have brown chins heavily punctated with dark brown or



Map. Solid circles mark type-localities; open circles indicate other localities. The precise type-locality of the nominate subspecies is unknown.

gray and the remainder of the ventral surface of the body heavily stippled with gray or black. The ventral surface of the tail is similar to the posterior ventral portion of the body, but usually becomes paler near the tip. The rattle matrix is buff to brown. A well-defined dark postocular stripe extends from the lower posterior margin of the eye to the angle of the jaw. The iris is two-toned, matching the dark postocular stripe and the paler ground color above the stripe. The supralabials below the postocular stripe usually are creamy white, however, they are usually somewhat darker in the Guerrero population. The infralabials usually have white or cream-colored spots, however, these spots are usually not pronounced in adults from Guerrero. Scutellation is as follows: 21 keeled (except lower 2 or 3



Figure 1. Adult *Crotalus intermedius* from near El Limón Totalco, Veracruz, México. Photograph by R. Wayne Van Devender.

rows on each side) scale rows at midbody (1 out of 162 examined has 23), 21 or 23 at one head length behind head, 15-19 (usually 17) at vent; 150-175 (\bar{X} = 161.6, n = 82) ventrals in males, 155-185 (\bar{X} = 168.3, n = 70) in females; 20-29 (\bar{X} = 24.6, n = 83) subcaudals in males, 17-24 (\bar{X} = 20.9, n = 68) in females; 0-8 subcaudals divided, most often first and/or some on posterior end of tail divided; 8-11 (usually 9, less frequently 10, rarely 8 or 11) supralabials and infralabials; usually 0 (rarely 1) prefoveals. The rostral is wider than high. Internasals are usually two (145 of 162 examined), rarely 3 (17 of 162). Canthals are paired with 1-4 (rarely 0) intercanthals. The frontal area contains 5-16 scales. The minimum number of scales in a row between the supraoculars is usually 2 or 3, rarely 1 or 4. Two scales in the parietal area may be slightly enlarged, with the remainder of the parietal area having small, irregular scales. The scales in the parietal region are not keeled (Fig. 3). The prenasal is larger than the postnasal and contacts the first supralabial. The postnasal contacts the first only, or both the first and second supralabials. When contacting the first supralabial only, it is because the first supralabial curves up behind the postnasal to cut off contact with the second supralabial. The postnasal usually contacts the internasal, rarely the internasal and canthal; occasionally the prenasal and loreal contact each other over a reduced postnasal. The loreal usually contacts the second supralabial only, or both the first and second, rarely the first only, and occasionally no supralabial. Preoculars are usually 2, very rarely 1 or 3. The lower preocular passes into the pit on 162 of 296 sides of specimens examined, over the pit to contact the loreal on 130 sides, and 4 sides have no lower preocular. Suboculars are almost always 2, rarely 1 or 3. The anterior subocular usually contacts the third and fourth supralabials. The posterior subocular usually contacts the fourth and fifth supralabials. The posterior edge of the orbit usually is opposite the fifth supralabial. The interocular usually is absent (rarely 1). The pit is usually situated on or below the naso-ocular line. The anal is always entire. Rattle fringe scales number 8-10.

The hemipenis (Fig. 2) is divided, with a bifurcated semi-centrifugal sulcus, the sulcus dividing near the base of the organ, with one branch extending to the distal end of each lobe. The everted organ is long, with each lobe tapering distally and extending to the level of the eighth to the eleventh subcaudals. The organ bifurcates at the level of the second or third subcaudal. Spines number 22-33 (\bar{X} = 26.6, n = 16 specimens) per lobe on the basal section, the size of the spines increasing outwardly from the sulcus, with the largest spines (6-12) on the outer shoulders. Spines are absent in the crotch and mesial area. A few spinules are present on the basal section immediately lateral to the sulcus; on the asulcate side this area is mostly bare with even fewer spinules than on the sulcate side. No spinules are present in the interspaces between the spines. The transition from spines to calyculated fringes is abrupt, occurring at the point of bifurcation of the organ. Rows of calyces number 23-33 (\bar{X} = 27.8, n = 15) per lobe (counted immediately lateral to sulcus). The borders of the calyces are spinulate. The distal end of each lobe is rounded. In having a low number of large spines per lobe, the *intermedius* hemipenis most closely resembles those of *C. triseriatus* (Klauber, 1972), *C. pusillus* (McCranie, 1983), and *Sistrurus raiatus* (McCranie, 1988). The overall appearance of the hemipenes of these four Mexican montane species is also very similar.

• Descriptions. Klauber (1952) provided the most thorough description of the species, although one based on few specimens. Davis and Dixon (1957, 1959) included descriptions of the color pattern and/or scutellation of additional specimens. Campbell and Lamar (1989) and Klauber (1972) provided summary descriptions of coloration and meristic characteristics.

• Illustrations. Color photographs of the species are in Campbell and Lamar (1989) and Mehrtens (1987). Black and white photographs are in Armstrong and Murphy (1979), Glenn and Straight (1982), Harris and Simmons (1978), Klauber (1956, 1972), Rubio (1972), and Smith (1946). Drawings showing the color pattern and/or the scutellation of the head are in Campbell and Lamar (1989), Fischer (1881), Gloyd (1940), Günther (1895), Klauber (1956, 1972), Smith (1946), and Taylor (1941). Drawings of some osteological characteristics are in Brattstrom (1964) and Smith (1946). Armstrong and Murphy (1979) included a habitat photograph.

• Distribution. The species occurs in disjunct populations in the mountains of south-central México. A population is known from southeastern Hidalgo, northeastern Puebla, and west-central Veracruz. An apparently isolated population occurs in southern Tlaxcala. An

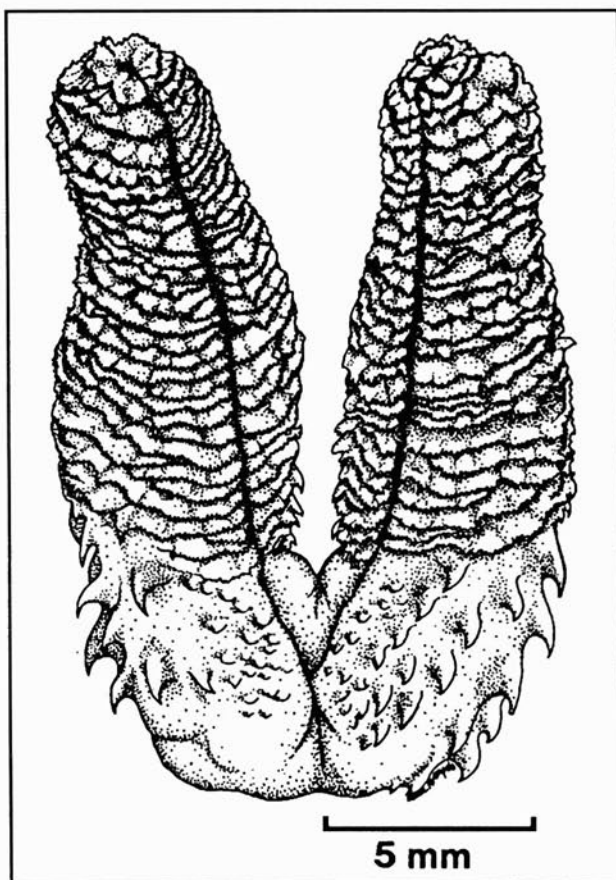


Figure 2. Sulcate side of right hemipenis of UTACV-R 4707.

isolated population also occurs in south-central Puebla. In Oaxaca, populations are known from the Sierra Juárez, Cerro San Felipe area, Sierra de Cuatro Venados, Sierra Madre del Sur, and Sierra de Mihuatlán. Another disjunct population occurs in the mountainous region west of Chilpancingo, Guerrero (old records for Chilpancingo probably are from west of this town). Throughout its range, the species is usually associated with pine-oak woodlands. However, the species occurs in upper elevation desert in south-central Puebla and southeastern Hidalgo. The elevational range of the species is from about 2000 to over 3000 m.

• Fossil Record. None.

• Pertinent Literature. Smith (1946) recognized the distinctness of this species, which had earlier (Amaral, 1927; Boulenger, 1896; Gloyd, 1940; Klauber, 1936, 1938; Taylor, 1941) been confused with *C. triseriatus*. Campbell (1982) demonstrated that the Michoacán specimen identified as *C. intermedius* (Duellman, 1961, 1965; Klauber, 1952, 1956, 1972) is more closely related to *C. transversus* than to *C. intermedius*. This specimen was the basis for the species' range being stated to include Michoacán in the following checklists: Brown (1973), Flores-Villela and Gerez (1988), Glenn and Straight (1982), Harris and Simmons (1978), Hoge (1966), Hoge and Romano (1971), Hoge and Romano Hoge (1981), and Klemmer (1963). Keys that distinguish *C. intermedius* from the remaining Mexican rattlesnakes are in Campbell and Lamar (1989) and Klauber (1952, 1956, 1971, 1972). Campbell and Lamar (1989) and Smith and Smith (1973, 1976) listed much of the literature on the species. Sanchez-Herrera and Lopez-Ortega (1987) reported the first specimens from the state of Tlaxcala. Other works and their subjects are: phylogeny within *Crotalus* (Brattstrom, 1964; Klauber, 1956, 1972; Stille, 1987); osteology (Brattstrom, 1964); information on scale microdermatoglyphics (Stille, 1987); habitat (Armstrong and Murphy, 1979; Campbell, 1988; Campbell and Armstrong, 1979; Klauber, 1956, 1972); food (Campbell and Armstrong, 1979; Klauber, 1956, 1972); reproduction (Armstrong and Murphy, 1979); bacterial infection (Murphy and Armstrong, 1978); venom (Minton, 1977). Van Bourgonien and Bothner (1969) used this species in a study of the arterial systems of some *Crotalidae*.

• **Etymology.** The name *intermedius* is derived from the Latin words *inter* (meaning between) and *medius* (meaning middle) in reference to Troschel's belief that this species was intermediate between snakes of the genera *Crotalus* and *Crotalophorus* (= *Sistrurus*); *gloydi* honors Howard K. Gloyd; *omiltemanus* refers to the type locality of this subspecies.

1. *Crotalus intermedius intermedius* Troschel Totalcan Small-Headed Rattlesnake

Crotalus intermedius Troschel, 1865:613 (see species synonymy).

Crotalus intermedius Fischer (not of Troschel, 1865), 1881:230. Type-locality, "aus Mexico." Holotype, Überseemuseum, Bremen (UMB) 435, an adult male, collected by a Mr. Kienast, date not given (not examined by author).

Sistrurus intermedius: Garman, 1884b:35.

Crotalus gloydi lautus Smith, in Smith and Lafe, 1945:353. A *nomen nudum*.

Crotalus gloydi lautus Smith, 1946:75. Type-locality, "at the lava beds about one kilometer east of El Limón Totalco, Veracruz." Holotype, National Museum of Natural History (USNM) 110598, an adult male, collected by Dyfrig McH. Forbes, 1 March 1940 (see also Smith, 1943:415, as *Crotalus triseriatus anahuacensis*, however, Cochran, 1961:170, gave 21 March 1940) (not examined by author).

Crotalus triseriatus anahuacensis Gloyd, 1940:91 (part).

Crotalus intermedius intermedius: Klauber, 1952:9 (part).

• **Definition.** Ventrals number 151-161 (\bar{x} = 157.8, n = 6) in males, 156-165 (\bar{x} = 159.2, n = 5) in females. The postnasal usually contacts both the first and second supralabials (19 of 20 sides examined, 95.0%), rarely the first only (1 of 20 sides, 5.0%). The loreal usually contacts the second supralabial only (18 of 20 sides, 90.0%), rarely both the first and second (1 of 20 sides, 5.0%) or neither supralabial (1 of 20 sides, 5.0%).

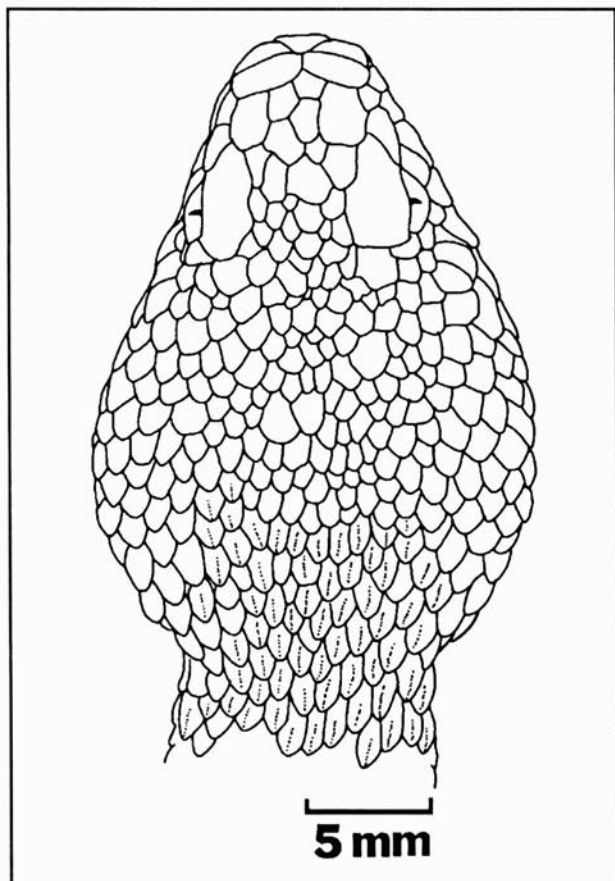


Figure 3. Dorsal surface of head (AMNH 100846) showing paired internasals and lack of keeling in the parietal area, both features characteristic of this species.

2. *Crotalus intermedius gloydi* Taylor Oaxacan Small-Headed Rattlesnake

Crotalus triseriatus gloydi Taylor, 1941:130. Type-locality, "Cerro San Felipe (elevation 10,000 ft.) near Oaxaca, Oaxaca, Mexico." Holotype, University of Illinois Museum of Natural History (UIMNH) 25070 (Smith et al., 1964:70), an adult male, collected by E.H. Taylor in 1940 (fide Smith et al., 1964:70 and Taylor, 1944:153) (not examined by author).

Crotalus gloydi: Smith and Taylor, 1945:191.

Crotalus gloydi gloydi: Smith, 1946:78.

Crotalus intermedius intermedius: Klauber, 1952:9 (part).

Crotalus intermedius gloydi: Davis and Dixon, 1957:25.

• **Definition.** Ventrals number 150-165 (\bar{x} = 158.7, n = 57) in males, 155-171 (\bar{x} = 165.0, n = 44) in females. The postnasal usually contacts the first supralabial only (146 of 202 sides, 72.3%), occasionally both the first and second (56 of 202 sides, 27.7%). The loreal most often contacts both the first and second supralabials (102 of 198 sides, 51.5%), occasionally the second only (49 of 198 sides, 24.8%) or neither (38 of 198 sides, 19.2%), rarely the first only (9 of 198 sides, 4.5%).

• **Remarks.** Armstrong and Murphy (1979:18-19) and Campbell and Lamar (1989:Fig. 353) considered a specimen from the high elevation desert near Cacaloapan, Puebla to be *C. i. intermedius*. I have examined this specimen (KU 155530), along with two others (AMNH 104474, UF/FSM 52552) of this desert population. These specimens resemble *C. i. gloydi* in the two characters that distinguish *gloydi* from *intermedius*. The postnasal contacts the first supralabial only on 4 of 6 sides (66.7%) and the loreal contacts both the first and second supralabials on 4 of 6 sides (66.7%) in these three specimens.

3. *Crotalus intermedius omiltemanus* Günther Omilteman Small-Headed Rattlesnake

Crotalus omiltemanus Günther, 1895:192. Type-locality, "Mexico, Omilteme in Guerrero." Syntypes (2), British Museum (Natural History) (BMNH) 1946.1.19.28-29, a juvenile female and an adult female respectively, collected by H.H. Smith, date not known, received from F. D. Godman in March 1895 (A. F. Stimson, pers. comm.) (not examined by author).

Crotalus triseriatus omiltemanus: Klauber, 1938:196.

Crotalus intermedius omiltemanus: Klauber, 1952:14.

Crotalus [omiltemanus]. omiltemanus: Shelford, 1963:464 (lapsus).

• **Definition.** Ventrals number 167-175 (\bar{x} = 171.1, n = 20) in males, 172-185 (\bar{x} = 176.8, n = 22) in females. The postnasal usually contacts both the first and second supralabials (69 of 84 sides, 82.1%), occasionally the first only (15 of 84 sides, 17.9%). The loreal usually contacts the second supralabial only (71 of 84 sides, 84.5%), occasionally both the first and second (11 of 84 sides, 13.1%), rarely the first only (1 of 84 sides, 1.2%) or neither (1 of 84 sides, 1.2%).

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